

Assessing methods to index inseason salmon abundance in the lower Copper River

Abstract: The U.S. Fish and Wildlife Service (USFWS), Office of Subsistence Management, funded the Native Village of Eyak (NVE) to undertake a three-year study (2001-2003) to develop and assess methods of monitoring salmon escapement in the lower Copper River. The ultimate goal of this project was to develop an annual monitoring program that could provide fishery managers with more timely indices of salmon escapement than those currently available from the Miles Lake sonar site (river km 52). A multi-faceted research design was developed to (1) significantly shorten the development time of a lower river test fishery; (2) study fish migratory behavior; and (3) compare the utility of acoustics and drift gillnets as test fishing tools. The majority of acoustic sampling was conducted at Flag Point Channel, located just downstream of Bridge 331 on the Copper River Highway. A total of 563 h of acoustic data were collected from 16 May to 10 June 2002. Different methods of counting fish (directly from echograms and tracked with acoustic software) and sampling (full and subsampled hours) from the acoustic data were compared. The tracked net upstream count (i.e., tracking software, full hours sampled, net upstream targets) was 25,261 salmon with a peak count of 3,234 salmon on 4 June. A second acoustic system was deployed periodically (3-4 h per day on 26 and 29 May, and 1, 4, and 7 June) at the Mile-37 Channel (Bridge 342) in 2002.

Drift gillnetting was conducted by the Alaska Department of Fish and Game (ADF&G) personnel at Flag Point Channel for a total of 27 days from 15 May to 10 June 2002. A total of 418 sockeye (*Oncorhynchus nerka*) and 34 Chinook (*O. tshawytscha*) salmon were captured during 1,174 min of fishing. Daily test fishing indices (fish per 100 fathom hours) for sockeye salmon peaked at 684 on 2 June, and the season cumulative index was 6,159. As in 2001, results from 2002 indicated that the acoustic and drift gillnetting sample sites at Flag Point Channel were suitable for developing a lower river test fishery. Both gear types detected similar pulses of fish and produced daily indices at Flag Point Channel that were correlated with indices generated from the Miles Lake sonar. In 2002, fish appeared to take 2-3 days early in the season, and closer to 1 day starting in late May, to migrate upstream from Flag Point Channel to the Miles Lake sonar site. Maximum likelihood estimation and regression analyses were used to compare the escapement indices generated at Flag Point Channel to those at the Miles Lake sonar site. Results indicated that both the catchability of the drift gillnet and the travel time of fish between the two sites varied over the study period.

Plans for 2003 include the continued use of both acoustic and drift gillnetting techniques in Flag Point Channel from early May to early June. It was recommended that sampling at the 37-Mile Channel be discontinued in 2003. Variability within and among years in catchability and travel time will continue to be evaluated. And lastly, the relative strengths and weaknesses of acoustics and drift gillnetting will be compared to determine which technique is most appropriate for future use in the lower Copper River.

Citation: Lambert, M. B., D. J. Degan, A. M. Mueller, J. J. Smith, S. Moffitt, B. Marston, and N. Gove. 2003. Assessing methods to index inseason salmon abundance in

the lower Copper River. U. S. Fish and Wildlife, Office of Subsistence Management, Fisheries Resource Monitoring Program, 2002 Annual Report, (Study No. 01-021). Native Village of Eyak, Cordova, Alaska.